



Tennessee Department of Environment and Conservation,  
Division of Water Pollution Control  
401 Church Street, 6th Floor L & C Annex, Nashville, TN 37243  
(615) 532-0625

880  
TNA 000 227

**CONCENTRATED ANIMAL FEEDING OPERATION (CAFO)  
STATE OPERATING PERMIT (SOP)  
NOTICE OF INTENT (NOI)**

Type of permit you are requesting: ☐ SOPCD0000 (designed to discharge) ☐ SOPC00000 (no discharge) ☐ Unknown, please advise  
Application type: ☐ New Permit ☒ Permit Reissuance ☐ Permit Modification  
If this NOI is submitted for Permit Modification or Reissuance provide the existing permit tracking number: TNA000227

**OPERATION IDENTIFICATION**

Operation Name: <u>TRICOR STSRCE Farm</u>		County: <u>Bledsoe</u>
Operation Location/ Physical Address: <u>286 Lake Russell Rd. Pikeville, TN 37367</u>		Latitude: <u>35.765797 N</u> Longitude: <u>85.765797W</u>
Name and distance to nearest receiving water(s): <u>Bee Creek - 2000 ft.</u>		
If any other State or Federal Water/Wastewater Permits have been obtained for this site, list those permit numbers: <u>N/A</u>		
Animal Type: <input type="checkbox"/> Poultry <input type="checkbox"/> Swine <input checked="" type="checkbox"/> Dairy <input type="checkbox"/> Beef <input type="checkbox"/> Other _____		
Number of Animals: <u>548</u>	Number of Barns: <u>2</u>	Name of Integrator: <u>Rick Matheson</u>
Type of Animal Waste Management: <input type="checkbox"/> Dry <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Liquid, Closed System (i.e. covered tank, under barn pit, etc.)		
Attach the NMP <input checked="" type="checkbox"/> NMP Attached	Attach the closure plan <input checked="" type="checkbox"/> Closure Plan Attached	Attach a topographic map <input checked="" type="checkbox"/> Map Attached

**PERMITTEE IDENTIFICATION**

Official Contact (applicant): <u>Rick Matheson</u>		Title or Position: <u>Farm Manager</u>		<input type="checkbox"/> Correspondence <input type="checkbox"/> Invoice	
Mailing Address: <u>286 Lake Russell Rd.</u>		City: <u>Pikeville</u>	State: <u>TN</u>		Zip: <u>37367</u>
Phone number(s): <u>(423) 881-3653</u>		E-mail: <u>Rick.Matheson@State.TN.US</u>			
Optional Contact: <u>Cary Wagner</u>		Title or Position: <u>Farm Crew Leader</u>		<input type="checkbox"/> Correspondence <input type="checkbox"/> Invoice	
Address: <u>286 Lake Russell Rd.</u>		City: <u>Pikeville</u>	State: <u>TN</u>		Zip: <u>37367</u>
Phone number(s): <u>(423) 881-3653</u>		E-mail: <u>N/A</u>			

**APPLICATION CERTIFICATION AND SIGNATURE** (must be signed in accordance with the requirements of Rule 1200-4-5-.05)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and title; print or type <u>Rick Matheson Farm Manager</u>	Signature <u>[Signature]</u>	Date <u>11-30-10</u>
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**STATE USE ONLY**

Received Date <u>DEC 03 2010</u>	Reviewer <u>[Signature]</u>	EFO <u>[Signature]</u>	T & E Aquatic Fauna <u>[Signature]</u>	Tracking No. <u>[Signature]</u>
Impaired Receiving Stream <u>[Signature]</u>		High Quality Water <u>[Signature]</u>		NOC Date <u>[Signature]</u>

**RECEIVED**

CN-1147 (Rev. 07-10)

DEC 03 2010

continued

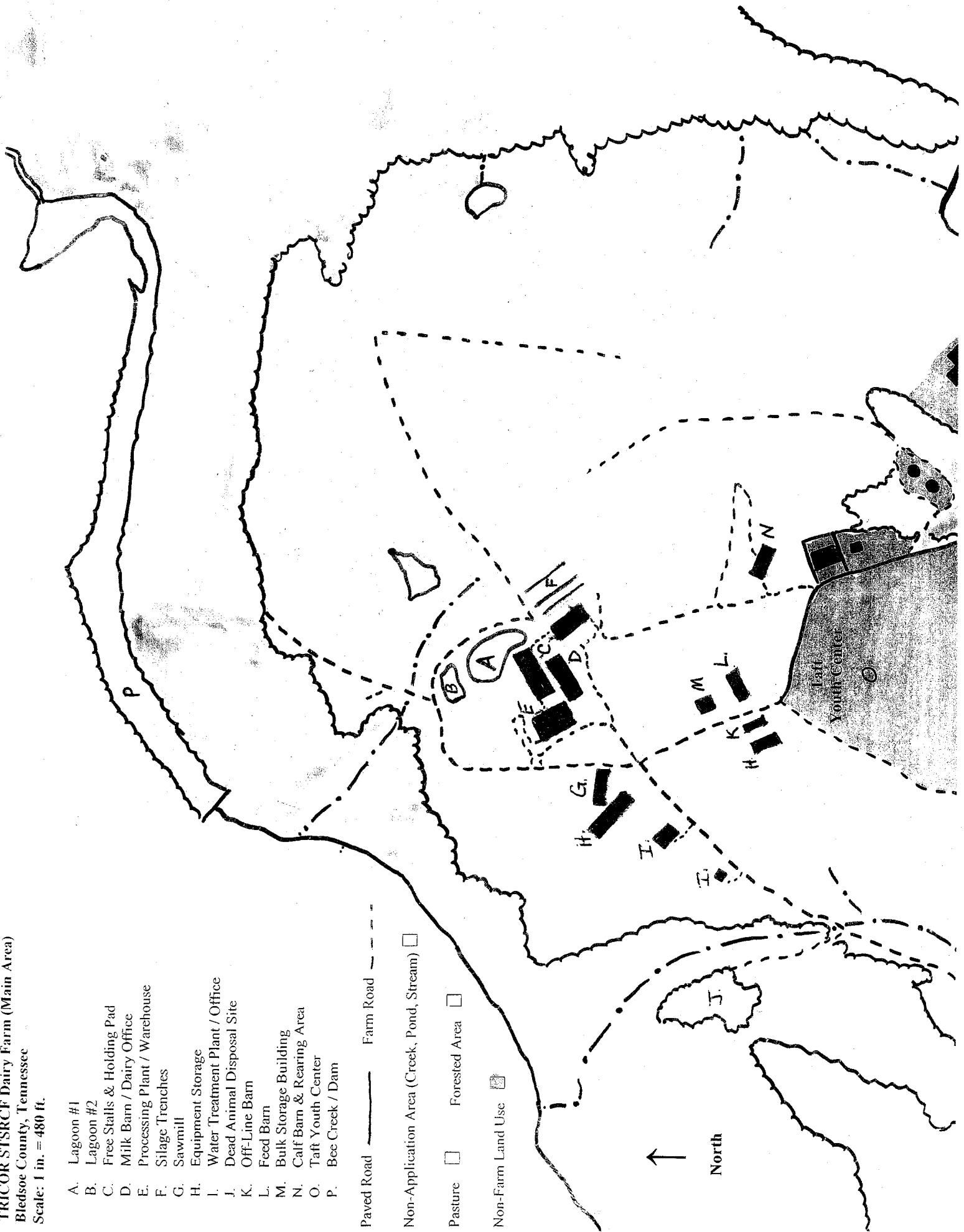
RDA 2366



**TRICOR STSRCF Dairy Farm (Main Area)**  
**Bledsoe County, Tennessee**  
**Scale: 1 in. = 480 ft.**

- A. Lagoon #1
- B. Lagoon #2
- C. Free Stalls & Holding Pad
- D. Milk Barn / Dairy Office
- E. Processing Plant / Warehouse
- F. Silage Trenches
- G. Sawmill
- H. Equipment Storage
- I. Water Treatment Plant / Office
- J. Dead Animal Disposal Site
- K. Off-Line Barn
- L. Feed Barn
- M. Bulk Storage Building
- N. Calf Barn & Rearing Area
- O. Taft Youth Center
- P. Bee Creek / Dam

- Paved Road ——— Farm Road - - - - -
- Non-Application Area (Creek, Pond, Stream) □
- Pasture □ Forested Area □
- Non-Farm Land Use ▣



# **Nutrient Management Plan**

**for**

## **TRICOR STSRCF Dairy Farm**

**286 Lake Russell Road  
Pikeville, Tennessee 37367  
Phone: 423 881-3653**

**2011**

VPC Permit Section

**RECEIVED**

**DEC 03 2010**

**TN Division Of Water  
Pollution Control**

## **PURPOSE AND CONDITIONS OF THIS PLAN**

This Nutrient Management Plan is a conservation system for the TRICOR STSRCF Farm Dairy. At a minimum, it is designed to address water quality and soil erosion concerns related to the dairy's concentrated animal feeding operation. The following concerns have been identified for this operation:

- Excessive nutrient runoff from the loafing and land application areas
- Excessive soil erosion where dairy cows loaf
- Adequate containment and management of manure & wastewater

Nutrient management involves managing the source, rate, form, timing, placement and utilization of manure and other nutrient sources, commercial or organic. The primary goal is to effectively and efficiently manage the nutrient resources in a way that maximizes plant utilization of the nutrients while minimizing nutrient buildup and runoff from the soil. The end result of this goal is to minimize the transport of nutrients to ground and surface waters so as to prevent environmental degradation.

Phosphorus has been identified as the primary nutrient on this operation that could pose a threat to ground and surface waters. Phosphorus leachate or runoff entering surface waters contributes to excessive algae growth, which lowers oxygen levels and impairs aquatic life, and contributes to distasteful drinking water. Phosphorus, however, is not the sole concern. Nitrogen and other nutrients and chemicals issuing from the dairy operation can pose environmental threats; however, the plan assumes that by addressing phosphorus, other threats will be minimized. Therefore, this nutrient management plan prescribes practices to minimize the transport of phosphorus from the dairy operation to waters of the state.

### **Conditions**

The Tennessee Department of Environment and Conservation (TDEC) acting under the authority of the Tennessee Water Quality Control Act of 1977 and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act requires that animal byproducts be managed so as not to enter the waters of the State. TDEC has designated the TRICOR Farm Dairy as a Class II Concentrated Animal Feeding Operation and has issued it a General NPDES Permit for Concentrated Animal Feeding Operation (Permit Tracking No. TNA000227). This nutrient management plan addresses the effluent limitations, monitoring requirements, and other conditions covered under this permit.

TRICOR manages areas of state property administered by the Tennessee Department of Corrections. This nutrient management plan addresses only the dairy's concentrated animal operation site and the fields on which manure may be applied. Operations not addressed in this plan include the beef herd and replacement heifer herd, which are maintained on pastures, and field crops that do not receive manure applications.

**Utilization of manure transported off-site and not under TRICOR control**

If wastes will be utilized on land not controlled by TRICOR, an agreement shall be signed by the individual, broker, or group accepting the waste stating: THE ANIMAL WASTE WILL BE APPLIED TO LAND TO MEET THE MINIMUM NRCS FIELD OFFICE TECHNICAL GUIDE STANDARDS FOR WASTE UTILIZATION (633) AND NUTRIENT MANAGEMENT (590); OR HAVE A COMPREHENSIVE NUTRIENT MANAGEMENT PLAN (CNMP) DEVELOPED ON THEIR LAND WITH NRCS OR APPROVED 3<sup>RD</sup> PARTY ASSISTANCE. Quantities of manure transported off-site shall be recorded; including the name of the recipient, address, date and amount transported.

## **CURRENT SYSTEM DESCRIPTION**

TRICOR maintains a milking herd of Holstein cows. Average milk cow weight is 1,300 lbs. The milking herd as of November 1, 2010 is at 211 head. On average 180 milk cows are on-line and confined in the concentrated animal feeding operation. On-line cows are kept on a concrete lot with two loafing barns and surrounding pastures. Dry cows and replacement heifers are maintained on pastures.

Roughly 416 acres of pasture, hay and field crops are maintained under the dairy operation with 114 acres of these utilized for corn silage.

The feed ration for the dairy cows consists primarily of corn silage, fescue hay and a formulated, dry concentrated feed. Generally, all the forages (46% of the total mix ration) are grown on the TRICOR Farm unless poor harvests lead to supplemental purchases. The formulated concentrate is purchased from a local farmer's co-operative. Based on feed analyses, the total mix ration consists of 0.38% Phosphorus (Dry Matter Basis).

An earthen lagoon adjacent to the concrete pad and loafing barns holds manure and wastewater. A smaller lagoon below the dam of the primary lagoon serves as a secondary catch basin. Both were originally built in the 1960's. The primary lagoon was enlarged in 1980 to contain the manure of approximately 180 cows confined 100% of the time. Runoff from the concrete pad and barn roofs and wastewater from the milk parlor drain into the lagoon. Manure from the concrete pad and barns are scraped daily into the lagoon. In 2007, the dairy's milk processing plant began pumping its wastewater into the lagoon.

Currently, the on-line cows are kept on the concrete pad and loafing barns 100% of the time during the winter months of December, January, and February. During all the other months the milking herd is rotated on surrounding pastures except during milking and feeding times. These pastures include Fields 3, 5, 6, 8 and 17, which comprise about 70 acres of land

## MANURE AND WASTEWATER HANDLING AND STORAGE

MANURE AND WASTEWATER STORAGE SYSTEM for TRICOR STSRCF Farm		
Animal Information		
Animal Type	Dairy Holstein - Lactating	
Number of Animals in CAFO	180	
Average Weight (lbs)	1,300	
Bedding Type	Sand	
Period (months)	March thru November	December thru February
% Confinement Time per Day	50%	100%
Days	275	90
Manure Storage Structure Sizing & Inputs		
Lagoon Surface Area (ft <sup>2</sup> )	39,250	
Runoff Area (ft <sup>2</sup> )	46,872	
Inputs	Mar - Nov	Dec - Feb
Rainfall (inches)	40	14
Evaporation (inches)	12	3
Wastewater (Mgal)	550	180
Cow Manure (tons)	660	432
Bedding (tons)	0	210
25-Year, 24-hour Rainfall Event (in.)	5	5
Volume (in cubic feet)		
Rainfall	287,073	100,476
Evaporation	-86,122	-21,531
Wastewater	73,529	24,064
Cow Manure	21,248	13,908
Bedding	0	4,000
25-Year, 24-hour Rainfall Event	35,884	35,884
Total Volume Needed	331,613	156,801
Estimated Volume Available	240,642	204,642
Storage Days	189	
Slurry Generated (gallons)	2,212,051	904,460
Estimated Storage Capacity	1,800,000 gallons	
Manure Analysis		
Nitrogen (lbs/ton)	8.001	Lab Analysis
Phosphorus (P <sub>2</sub> O <sub>5</sub> ) (lbs/ton)	5.104	Lab Analysis
Potassium (K <sub>2</sub> O) (lbs/ton)	3.933	Lab Analysis
Estimated Nutrients Generated Annually		
Deposit Location	Lagoon	Pastures
Nitrogen (lbs)	8,732	5,277
Phosphorus (P <sub>2</sub> O <sub>5</sub> ) (lbs)	5,570	3,367
Potassium (K <sub>2</sub> O) (lbs)	4,292	2,594
Estimated Slurry Availability & Nutrient Concentration		
March 1 <sup>st</sup>	1,515,790	
Nutrient Concentration of Slurry	3.24	N per 1,000 gal.
	2.07	lbs P <sub>2</sub> O <sub>5</sub> per 1,000 gal.
	1.59	lbs K <sub>2</sub> O per 1,000 gal.
September 15 <sup>th</sup>	1,600,720	
Nutrient Concentration of Slurry	2.39	N per 1,000 gal.
	1.52	lbs P <sub>2</sub> O <sub>5</sub> per 1,000 gal.
	1.17	lbs K <sub>2</sub> O per 1,000 gal.



Manure Lagoon. The earthen storage lagoon has a current estimated capacity of about 240,642 cubic feet or 1,800,000 gallons. The lagoon is capable of holding all the manure, wastewater, normal rainfall and runoff that is generated during the winter months when there is no land application and when the milk cows are under 100% confinement (i.e. not on pastures). The lagoon has approximately 189 days of storage under 100% confinement and when allowing a buffer for a 25 year, 24 hour rain event. Under a year round 100% confinement scenario, the lagoon would require a complete pump out at least three times a year.

However, under split confinement, the lagoon can feasibly be pumped out just twice a year. A split confinement would consist of 100% confinement to the concrete pad and loafing barns from December through February and no more than 50% confinement during the other months. Split confinement eliminates the input of sand for 9 months of the year. It also deposits up to 660 tons of cow manure on the pastures rather than in the lagoon. Under this scenario, if the lagoon is pumped out in the middle of September, then approximately 1,515,790 gallons of slurry is available for pump out on March 1<sup>st</sup> and 1,600,720 gallons of slurry is available for pump out on September 15<sup>th</sup>.

### **Operation & Maintenance**

- 1) The maximum operating level of the lagoon is 13 vertical inches below the berm of the dam. When this level is reached, pump-out should begin as long as soil conditions exist that will allow for infiltration of the slurry. Pump-out is not to occur in December, January, or February. Pump-out should not be scheduled if severe or wet weather is a threat. The elevation at which pump-out is to occur shall be marked with a post or other suitable device. Annual removal of slurry should be about 3,117,000 gallons, which is estimated to be around 57 hours of pump time using a drag line with tractor mounted splash pan.
- 2) Vegetation, warning signs, conveyance pipes, and concrete around the lagoon will be maintained in good condition. Areas around the lagoon will be kept vegetated, mowed and accessible.
- 3) Wasted hay or foreign material should not be put into the lagoon.
- 4) Thoroughly agitate the lagoon prior to and during pump-out to ensure uniform distribution of nutrients.
- 5) Domestic and industrial waste from toilets shall not be discharged into the lagoon other than the processing wastewater from the milk processing plant.
- 6) In case of overflow or spill, follow procedures in the **Emergency Response Plan**.
- 7) In the event of closure or shutdown where there is no longer a need to manage manure and runoff from this operation, the **Closure Plan** will be followed.

**Dead Animal Management**

Dead animals will be disposed of according to state and local laws and in a way that does not adversely affect ground or surface water or create other public health concerns. The TRICOR Dairy buries as a means of mortality disposal. A site has been designated in the northwest portion of the farm between Fields 1 & 2. Carcasses are buried 6 feet deep and lime is applied to the body before internment.

**Closure Plan**

The dairy is managed by TRICOR (Tennessee Rehabilitative Initiative in Corrections) on state property administered by the Tennessee Department of Corrections. Should the dairy operations cease, TRICOR will be responsible for pumping out the lagoons and applying the slurry on fields designated in the nutrient budget in such a manner and time to minimize risk of soil erosion and nutrient transport.

## NUTRIENT MANAGEMENT

### Application Rates

Manure will be stored in the lagoon with runoff from the feedlot and wastewater from the milk processing plant and milk parlor. The slurry from this lagoon will be land applied to fields according to the amount of  $P_2O_5$  removed annually from harvested crops.

### Land Requirements for Strategic Planning

#### Summary of Calculations Used in Strategic Planning

<b><math>P_2O_5</math> Removal Rates (lbs / ac)</b>	<b>Corn Silage</b>	<b>= 15 tons / ac x 2.2644<sup>*</sup> lbs <math>P_2O_5</math> / ton = 34 lbs <math>P_2O_5</math> / ac</b>
	<b>Wheat Silage</b>	<b>= 4 tons / ac x 2,000 x 0.15% P<sup>**</sup> x 2.29<sup>***</sup> = 27 lbs <math>P_2O_5</math> / ac</b>
<b>Manure <math>P_2O_5</math> Produced</b>		<b>= 1,300<sup>****</sup> lbs x 4.1%<sup>*****</sup></b>
		<b>= 53.3 lbs Manure per cow per day</b>
		<b>= 53.3 lbs x 0.2552% <math>P_2O_5</math><sup>*****</sup></b>
		<b>= 0.1360 lbs <math>P_2O_5</math> per cow per day</b>
		<b>= 0.1360 lbs <math>P_2O_5</math> x 180 cows x 365 days per year</b>
		<b>= 8,935 lbs <math>P_2O_5</math> per year</b>
<b><math>P_2O_5</math> Distribution with Split Confinement</b>	<b>Pasture</b>	<b>= 0.1360 lbs <math>P_2O_5</math> x 180 cows x 137.5 days per year = 3,366 lbs <math>P_2O_5</math></b>
	<b>Lagoon</b>	<b>= 0.1360 lbs <math>P_2O_5</math> x 180 cows x 227.5 days per year = 5,569 lbs <math>P_2O_5</math></b>
<b>Acres Required for <math>P_2O_5</math> Mass Balance (100% Confinement)</b>	<b>Corn Silage</b>	<b>= 8,935 lbs <math>P_2O_5</math> ÷ 34 = 263 acres</b>
	<b>Wheat Silage</b>	<b>= 8,935 lbs <math>P_2O_5</math> ÷ 27 = 331 acres</b>
	<b>Corn / Wheat Silage</b>	<b>= 8,935 lbs <math>P_2O_5</math> ÷ 61 = 146 acres</b>
<b>Acres Required for <math>P_2O_5</math> Mass Balance (Split Confinement)</b>	<b>Corn Silage</b>	<b>= 5,569 lbs <math>P_2O_5</math> ÷ 34 = 164 acres</b>
	<b>Wheat Silage</b>	<b>= 5,569 lbs <math>P_2O_5</math> ÷ 27 = 206 acres</b>
	<b>Corn / Wheat Silage</b>	<b>= 5,569 lbs <math>P_2O_5</math> ÷ 61 = 92 acres</b>
<sup>*</sup> lbs of $P_2O_5$ removed from 1 ton of mature corn silage according to USDA PLANTS Database <sup>**</sup> percentage of P in 1 ton of wheat silage based on forage analysis (2008) <sup>***</sup> conversion ratio for P to $P_2O_5$ <sup>****</sup> average Holstein milk cow weight on TRICOR STSRFC Farm <sup>*****</sup> percent body weight manure produced per day <sup>*****</sup> percent $P_2O_5$ in manure based on analysis (2007)		

If an average of 180 head is kept on the concentrated feeding operation 100 percent of the time, then approximately 8,935 lbs of  $P_2O_5$  would need to be land applied. This would require 263 acres of corn silage (15 tons/ac) or 146 acres of corn silage followed by a crop of wheat silage (4 tons/ac).

Currently, the Farm has 107 acres of corn silage acreage easily accessible to pumping. If this acreage was utilized for corn silage followed by a wheat silage crop, then approximately 3,638 lbs of  $P_2O_5$  could be used. The remaining 5,297 lbs of  $P_2O_5$  could be applied to 177 acres of fescue hay fields (3.5 tons/ac), which utilize about 30 lbs  $P_2O_5$  per acre.

Under a split confinement scenario, in which cows are kept on fields 50 percent of the time for 9 months, 3,366 lbs of  $P_2O_5$  would be distributed on these fields. The remaining 5,569 lbs of  $P_2O_5$  would require 164 acres of corn silage to be utilized or 92 acres of corn silage followed by wheat silage to be utilized.

## P Index

The Tennessee Phosphorous Index has been calculated for all fields. Calculations were made using procedures in Notes on the Use of the Tennessee Phosphorous Index (Anderson and Walker 2001). Fields 18, 19 and 21 have a medium potential for phosphorus runoff based on their P Index value. On fields having a low or medium potential for phosphorus runoff,  $P_2O_5$  may be applied according to soil test result recommendation even if the application rates exceed the utilization rates.

## Manure Application Recommendation Summary

Where to Apply	Acres	When to Apply	On What Crops	Amount to Apply
Field 18	12	March	Corn Silage	Approximately 16,500 gallons per acre
Field 19	40	March	Corn Silage	Approximately 16,500 gallons per acre
Field 21	40	March	Corn Silage	Approximately 16,500 gallons per acre
Field 18	12	September	Wheat Silage	Approximately 17,400 gallons per acre
Field 19	40	September	Wheat Silage	Approximately 17,400 gallons per acre
Field 21	40	September	Wheat Silage	Approximately 17,400 gallons per acre

### \* NOTES:

- Above recommendations are rounded for simplicity and based on:
  - Estimated  $P_2O_5$  concentration of slurry at time of application
  - Average corn silage yield of 15 tons per acre and wheat silage yield of 4 tons per acre
  - $P_2O_5$  utilization rate of 34 lbs per acre for corn silage and 27 lbs per acre for wheat silage
  - Split confinement scenario in which cows are on pasture 50% of time during 9 months of the year
- Applying at the above recommended rates and acreage will empty the lagoon.
- The above recommended application rates are equivalent to about 0.60 inch of rainfall.

### **Soil Testing – Standard Operating Procedures**

Soil samples are to be collected in accordance with the University of Tennessee Extension Service (UT PB 1061). On fields having received slurry or commercial fertilizer applications, a minimum of 1 composite sample shall be taken per every 10 acres. Soil samples should be collected in the fall of even-numbered years. Samples should be labeled using the following format: FN-CC-YY, where FN is the Field Number with subsection, CC is the crop code and estimated yield per acre for that field as used by UT Extension Service, and YY is the sample year. For example, on Field Number 1, which is 21 acres, where corn silage will be planted with an estimated yield of 15 tons per acre, the two soil samples collected in 2011 would be labeled #1A-CS15-11 and 1B-CS15-11.

Soil samples should be sent to the UT Soil, Plant and Pest Center for analysis. As a minimum, a soil test analysis must include pH, phosphorus, and potassium results.

Pre-Plant Soil Nitrate (PPSN) and Pre-Sidedress Nitrogen Test (PSNT) analyses may be necessary to determine nitrogen amendments to what is provided by slurry applications.

Soil tests are required to ensure nutrients are being applied at appropriate agronomic rates. Soil nutrient levels of each field should be monitored by soil testing to determine phosphorus buildup in the soils. Soil testing also will be used to determine nitrogen, potassium and lime recommendations for specific fields. Lime amendments based on soil test results should be applied when necessary to optimize utilization of nutrients.

### **Manure Testing – Standard Operating Procedures**

Solid manure samples should be collected annually or following significant changes in the total mix ration. Three composite samples should be taken to represent the average manure that is being scraped into the lagoon. Samples should be labeled using the following format: MMYN, where MM is the month, YY is the year, and N is the composite sample number. For example, the second composite sample taken in November 2010 would be labeled 1110-2.

Samples should be mailed to the laboratory on the collection day or the next day if samples are refrigerated. Do not send samples that can not be delivered within one or two business days from the collection date. At a minimum, manure test analysis must be for nitrogen, phosphorus ( $P_2O_5$ ) and potassium ( $K_2O$ ) concentrations, expressed in pounds per ton. Solid manure test results will be used to estimate slurry concentrations for strategic planning and used to monitor nutrient use efficiency of the milking herd.

### **Lagoon Slurry Testing – Standard Operating Procedures**

Liquid lagoon slurry samples should be collected during each pump-out after the lagoon has been thoroughly agitated. The following procedures should be conducted at the beginning, middle, and end stages of the pump-out to produce three separate composite samples. At each stage collect 8 grab samples into a 5-gallon bucket and mix thoroughly. Preferably, grab samples should be taken from the application equipment – either at the point of exit or from a release

valve on the pumping mechanism. If this is not possible, grab samples may be taken at least 6 feet from the lagoon bank at 8 random locations. Fill a 1-pint plastic, wide-mouth jar, leaving a 1-inch head space, with slurry from the 5-gallon bucket in order to create a composite sample for that stage. Each composite sample should be labeled using the following format: MMYN, where MM is the numerical month, YY is the year, and N is the pump-out stage (1= beginning, 2= middle, 3= end stage). For example, the composite sample for the middle stage of a pump-out occurring in March 2011 would be labeled #0311-2. Samples should be mailed to the laboratory on the collection day or the next day if samples are refrigerated. Do not send samples that can not be delivered within one or two business days from the collection date.

At a minimum, the slurry samples should be tested for total nitrogen, phosphorus ( $P_2O_5$ ) and potassium ( $K_2O$ ) concentrations, expressed in pounds per 1,000 gallons. Nitrogen analysis may be refined to include Total Kjeldahl Nitrogen (TKN), Ammonium-N, and Nitrate-N to better predict available nitrogen in the slurry. Slurry sample test results will be used to document adherence to the nutrient management plan and to determine to what degree fertilization recommendations have been met with slurry application.

### **Forage Testing – Standard Operating Procedures**

Forage samples should be taken for each crop from each field under this plan on which slurry or commercial fertilizer has been applied. Forage samples are to be collected in accordance with the University of Tennessee Extension Service. Samples should be labeled using the following format: FN-CC-YY, where FN is the Field Number, CC is the crop code and yield per acre for that field as used by UT Extension Service, and YY is the harvest year. For example, if Field #1 yielded 12 tons per acre of corn silage in 2011, then the sample from that field is #1-CS12-11. Forage samples should be sent to the UT Soil, Plant and Pest Center for analysis.

A minimum basic forage test should be performed to determine protein, fat, ADF-fiber, NDF-fiber, calcium, phosphorus, magnesium, potassium, TDN, net energy, and RFV. Basic forage test results will be used to document adherence to the nutrient management plan and refine estimated values of  $P_2O_5$  removed from each field.

### **Land Application Operation Requirements**

1. Generally, all lagoon slurry applications are to be  $P_2O_5$  based and annual  $P_2O_5$  amendments are not to exceed what can be utilized and removed from that year's crop. However, if the P-Index of a particular field rates a low to medium risk for phosphorus transport, then slurry applications may be nitrogen based and P amendments may follow recommendations in the most recent soil test report. Nitrogen and potassium amendments will be based on the recommendations of the most recent soil test results.
2. Do not apply nutrients in December, January, or February.
3. If the crop, method of application, or feed ration changes significantly, it will be necessary to re-calculate an appropriate application rate.
4. Nutrients from any source shall not be applied on saturated, frozen and/or snow covered soil.
5. Nutrients will not be spread in an established drainage way that carries concentrated flow.

6. Nutrients can not be applied on land that is subject to frequent flooding unless it is incorporated immediately.
7. Nutrients can not be applied when imminent rain is expected.
8. Whenever feasible, fields on which slurry is to be applied should be aerated just prior to application to increase infiltration, or slurry should be incorporated into the soil following application.
9. A vendor applying slurry or commercial fertilizer must use properly calibrated equipment and to the vendor's best ability apply at the designated rates.
10. Non-application buffer widths will be maintained in fields receiving lagoon slurry following recommendations for the situations listed in the table below.

#### **Non-Application Buffer Widths**

<b>Object, Site</b>	<b>Situation</b>	<b>Buffer Width (ft.) from Object Site</b>
<b>Well</b>	<b>Located up-slope of application site</b>	<b>150</b>
<b>Well</b>	<b>Located down-slope of application site</b>	<b>300</b>
<b>Waterbody or stream<sup>1/</sup></b>	<b>Predominate slope &lt; 5% with good vegetation<sup>2/</sup></b>	<b>30</b>
<b>Waterbody or stream<sup>1/</sup></b>	<b>Predominate slope 5 - 8% with good vegetation<sup>2/</sup></b>	<b>50</b>
<b>Waterbody or stream<sup>1/</sup></b>	<b>Poor vegetative cover or Predominate slope &gt; 8%</b>	<b>100</b>
<b>Waterbody or stream<sup>1/</sup></b>	<b>Cultivated land, low erosion</b>	<b>30</b>
<b>Public Road</b>	<b>All</b>	<b>50</b>
<b>Dwelling</b>	<b>Other than TRICOR</b>	<b>300</b>
<b>Public Use Area</b>	<b>All</b>	<b>300</b>
<b>Property Line</b>	<b>Located downslope of application site</b>	<b>30</b>

1/ Waterbody includes pond, lake, wetland or sinkhole. Stream includes both perennial and intermittent streams.

2/ Good vegetation refers to a well-managed, dense stand which is not overgrazed.

11. Fields receiving nutrients should have soil samples collected in the fall of even-numbered years.
12. Maintain records of where nutrients are applied.

## LAND TREATMENT PRACTICES

### Planned Treatment Practices

Planned Management and Structural Practices	Location	Units	Time
Nutrient Management - Cow manure and commercial fertilizer will be applied to land to help meet crop nutrient needs. Application rates, soil testing, manure analysis, forage analysis, and record keeping will be performed according to the <b>Nutrient Management</b> section of this plan.	Fields 18, 19, & 21	92 acres	Annually
Maintain manure non-application buffers of at least 30 feet from all waterways in the field and 50 feet from public roads	Fields 18, 19, & 21	92 acres	Annually
Manure Storage Facility - The existing storage facility will be operated and maintained as indicated in this plan. A stage marker or other suitable device will be installed to indicate when pump-out is necessary.	LAGOON		As Needed
Diversions - to be maintained to divert surface flow away from facilities and lagoon	CAFO		As Needed
Rotational Loafing Lot / Grazing System - create a rotational loafing lot system to reduce sediment and manure transport and improve herd health & comfort	Fields 3, 5, 6, 7, 8 & 17	70 acres	Winter 2008

### Rotational Loafing Lot / Grazing System Plan

A split confinement system is prescribed in order to extend lagoon storage time, to reduce required acreages needed for application, and to reduce sand content in the lagoon. The split confinement system requires that the milk cows be on surrounding pastures for at least 50 percent of the time during nine months of the year. There are about 70 acres of available fields for confinement of the milking herd.

An estimated 3,366 lbs of  $P_2O_5$  will be deposited annually on these fields. There is already a heavy accumulation of phosphorus on these fields and accumulation will continue. In addition, excessive cow traffic and potential lack of vegetation could lead to increased risks of phosphorus movement and to health problems for the cows.

It is imperative that a conservation plan be developed for these fields to minimize phosphorus runoff and soil erosion and to promote herd health.

These fields can be managed as a rotational loafing lot system, a rotational grazing system or a combination of both.



## RECORD KEEPING

The following records shall be retained and available for inspection, upon request, by the Tennessee Department of Environment and Conservation commissioner or agent or an agent of the EPA, for five years:

- a. A copy of the Site-Specific Nutrient Management Plan;
- b. Documentation regarding the following visual inspections:
  - i. Weekly inspection of all storm water diversion devices, runoff diversion structures and devices channeling contaminated storm water to the lagoon
  - ii. Daily inspection of water lines, including drinking or cooling water lines, and
  - iii. Weekly inspection of the manure lagoon noting the liquid level in the impoundment.
- c. Weekly records of the depth of the manure lagoon as indicated by the required depth marker which indicates the minimum capacity necessary to contain runoff and direct precipitation of the 25 year, 24-hour rainfall event.
- d. Corrective actions taken.
- e. Mortalities management and practices used to comply with the nutrient management plan;
- f. Records documenting the current design of the lagoon, including volume for solids accumulation, design treatment volume, total design volume, and approximate number of days of storage capacity;
- g. Records of the date, time, and estimated volume of any overflow;
- h. Expected and actual crop yields where land application was used;
- i. Date(s) slurry is applied to each field;
- j. Weather conditions at time of application and for 24 hours prior to and following application;
- k. Test methods used to sample and analyze manure, slurry, and soil;
- l. Results from manure, slurry, and soil sampling;
- m. Explanation of the basis for determining manure application rates.
- n. Calculations showing the total nitrogen and phosphorus to be applied to each field, including sources other than the slurry;
- o. Total amount of nitrogen and phosphorus actually applied to each field, including documentation of calculations for the total amount applied;
- p. The method used to apply slurry; date(s) of slurry application, equipment inspection, and calibration;
- q. The date, recipient name and address, and approximate amount of slurry transferred to a 3<sup>rd</sup> party.

Master copies of record keeping forms shall be kept in the appendix of this plan.

An annual report must be submitted to TDEC and TDA between January 1 and February 15 of each year at the addresses below:

CAFO Annual Report  
Tennessee Department of Environment and Conservation  
Division of Water Pollution Control  
6<sup>th</sup> Floor L &C Annex  
401 Church Street  
Nashville, TN 37243-1534

CAFO Annual Report  
Tennessee Department of Agriculture  
Ellington Agriculture Center  
Nashville, TN 37204

## LAGOON SLURRY DISCHARGE EMERGENCY RESPONSE PLAN

<b>Farm Name</b>	TRICOR STSRCF Farm
<b>Address</b>	286 Lake Russell Road; Pikeville, TN 37367
<b>Farm Phone</b>	(423) 881-3653; (423) 881-3251 ext. 2066
<b>NPDES Permit #</b>	TNA000227
<b>GPS Coordinates</b>	35.7657 N (Lat.) and 85.7657 W (Long.)
<b>DIRECTIONS TO FARM</b>	From I-40 take Peavine Road Exit #322, follow Hwy 101 south for approximately 25 miles, go right onto Hwy 285 and follow straight onto Hwy 301 towards Taft Youth Center. Dairy is behind Taft.
<b>Nearest State Waters</b>	Bee Creek
<b>Emergency Phone Numbers</b>	
<b>Farm Owner</b>	TRICOR - State of Tennessee
<b>Farm Manager</b>	Rick Matheson (423) 228-4990 (Cell)
<b>Additional Contacts</b>	Carey Wagner (931) 484-1681
	Southeast Regional Correctional Facility, Jim Marrow - Warden (423) 881-3251 ext. 3911 for Emergencies
<b>CONTACTS TO BE MADE WITHIN 24 HOURS</b>	
<b>TDEC Environmental Assist. Center</b>	1-888-891-8332 or (423) 634-5745 (Chattanooga Office)
<b>TWRA</b>	1-800-890-8366

**In case of a Lagoon Overflow, Leak or Failure Emergency:**

1. Implement the following first containment steps:
  - a. Stop all other activities to address the emergency
  - b. Stop all flow into the lagoon.
  - c. Assess the extent of damage and determine what is needed.
  - d. Use a skid loader, tractor with blade, or bulldozer to contain or divert the spill or leak, if possible.
  - e. Call for assistance if needed.
2. The Tennessee Department of Environment and Conservation must be orally notified within 24 hours and a written notification must be sent within 5 working days of the discharge. A copy of the written notification should be kept in the mandatory file. The notification shall include:
  - a. Description of the discharge: the flow path to the receiving water and an estimation of the flow rate and volume discharged.
  - b. Time of the discharge: exact date and time and estimated duration.
  - c. Cause of the discharge: if caused by a precipitation event, include the rain gauge measurement of the event.
  - d. Corrective actions: steps being taken to reduce, eliminate, and prevent recurrence of discharge as well as to ameliorate the impact of the discharge.
3. Any discharge to waters of the state must be sampled within thirty minutes of the start of the discharge. A minimum of one grab sample that represents the discharge must be collected and be analyzed for the following parameters:
  - a. pH: must be analyzed within 15 minutes of collection (*Field Measurement*)
  - b. Temperature, Effluent: (*Field Measurement*)
  - c. BOD5 (*Lab analysis*)
  - d. Total Suspended Solids (*Lab analysis*)
  - e. Nitrogen, Total (*Lab analysis*)
  - f. Nitrogen, Ammonia Total (*Lab analysis*)
  - g. Total Kjeldahl Nitrogen (*Lab analysis*)
  - h. Nitrate Nitrogen (*Lab analysis*)
  - i. Phosphorus, Total (*Lab analysis*)
  - j. Phosphorus, Dissolved (*Lab analysis*)
  - k. Copper, Total (*Lab analysis*)
  - l. E. coli (*Lab analysis*)
  - m. Zinc, Total (*Lab analysis*)
  - n. Fecal Coliform (*Lab analysis*)
4. The discharge sample analysis report must be submitted to TDEC by the 15<sup>th</sup> of the month following the discharge date. A copy of this should be kept in the mandatory file.
5. An emergency response kit should be maintained and contain the following:
  - a. Response and sampling procedures, collection equipment, sample bottles, analysis form with test requests and mailing address, chain of custody form, pH meter, thermometer, TDEC field office phone number and Hot-Line number.